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Differential virological diagnosis of acute respiratory infections in suspect SARS patients

I. GROG

Collective Name of the GROG Network: Groupes Régionaux d'Observation de la Grippe, France

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Abstract. The NIC in Lyon has been involved in the virological diagnosis of suspect severe acute respiratory syndrome (SARS) patients. In March, the French medical authorities organized a medical surveillance of the medical staff who had returned from the French hospital in Hanoi. Each person presenting or not with respiratory symptoms was sampled systematically by the nearest general practitioner (GP) belonging to the influenza network surveillance in the community called GROG and the samples were sent to the NICs located either in Paris or in Lyon. We also received samples from patients hospitalized in the south of France suffering from acute respiratory infection soon after a journey in Asia. We implemented a PCR diagnosis for the human respiratory viruses: influenza A and B, Parainfluenza (Type 1 to Type 4), Metapneumovirus, RSV, Rhinovirus, Enterovirus, Adenovirus. In April, we set up the PCR detection of the SARS-associated coronavirus Urbani strain. The practitioners performed respiratory samples. From 14 March to 15 May we received and tested 88 respiratory samples, respectively, 19 were realized by GPs from the community network and 69 came from hospitalized patients. We never detected the urbani coronavirus strain. However, we detected respiratory viruses in 24% of the cases: the most frequent virus was influenza A H3N2 (11%) and Parainfluenza type 3 (8%). RSV, influenza A H1N1 and Rhinovirus were also detected 2, 1 and 1 cases, respectively. All the positive samples except the rhinovirus came from hospitalized patients. The patients were sampled once and all of them recovered rapidly.

Keywords: SARS; Virological diagnosis

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1. Introduction

Severe acute respiratory syndrome (SARS) is an emergent disease that was reported by the Hanoi French hospital after admission of a patient back from China and presenting with a severe pneumopathy.

2. Materials and methods

Upon arrival in France, the medical staff from the French hospital in Hanoi has been sampled by a doctor belonging to the GROG network. Any person back from Asia and presenting an ILI were hospitalized and sampled. We implemented a molecular diagnosis with specific primers for the detection of influenza A and B viruses, RSV, parainfluenza viruses, metapneumoviruses, adenoviruses, rhinoviruses and enteroviruses. We set up the nested PCR detection of the SARS-associated coronavirus Urbani strain (SARS-CoV) [2]. We used a synthetic RNA kindly provided by Pr Sylvie van der Werf as positive control.

3. Results

From the systematic surveillance of persons back from Hanoi or suspect hospitalized patients we received 88 samples. According to WHO case definition [1], out of the 69 hospitalized patients 18 were defined as suspect cases and 16 were contact patients. The PCR diagnosis was performed on each sample. We never detected the urbani coronavirus but common respiratory viruses in 24% of the cases. The most frequent virus was influenza A H3N2 (10 cases). Parainfluenza type 3 was almost as frequent (seven cases) while the other viruses were sporadic RSV (2 cases), influenza A H1N1 (1 case) and rhinovirus (1 case) (Fig. 1). The influenza A viruses have been cultivated on MDCK

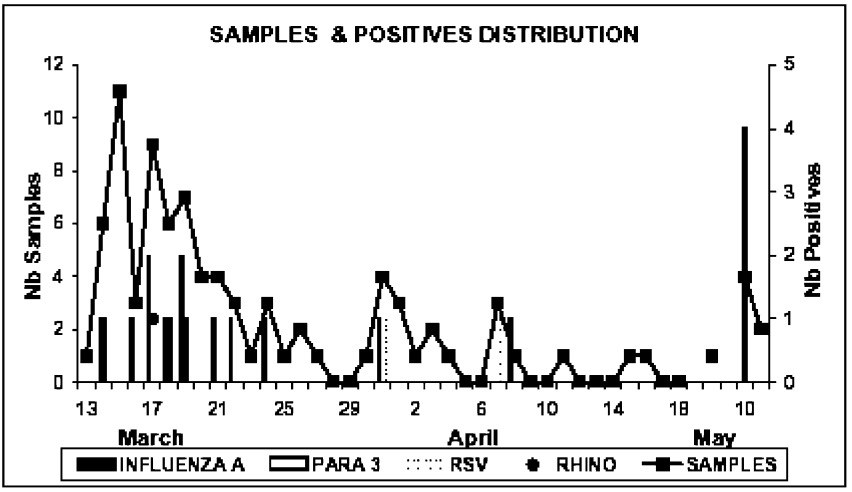

Fig. 1. Differential virological diagnosis in suspect SARS patients.

cells for antigenic characterization. We grew seven strains, six H3N2 and one H1N1 all related to the vaccine prototype strains. The A H3N2 isolates were sensitive to the neuraminidase inhibitors [3].

4. Discussion

The SARS diagnosis was implemented at the NIC in Lyon for the survey of patients in the south of France. The RT-PCR based on the polymerase gene was performed on each sample according to Drosten's technique [2] but an alternative diagnosis was also developed for the human respiratory viruses with use of RT-PCR [4,5]. No SARS-CoV has been detected but none of the patients fulfilled the case definition of SARS. The clinical symptoms were associated with other respiratory viruses such as influenza.

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